

Application No.: 10/807007

Case No.: 58709US004

**Amendments to the Claims:**

The following Listing of Claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. (Original) A telechelic (co)polymer comprising polymerized units of one or more free radically (co)polymerizable monomers,  
a first ring-opened azlactone terminal group; and  
a second terminal group selected from a xanthate group, a thioxanthate group, or a dithioester group .
2. (Original) The copolymer of claim 1 comprising two or more blocks of units obtained from free radically (co)polymerizable monomers, wherein the block copolymer has first ring-opened azlactone terminal group and a second terminal group selected from a xanthate group, a thioxanthate group, or a dithioester group.
3. (Original) The (co)polymer of claim 1 comprising polymerized units obtained from two or more radically (co)polymerizable monomers wherein the copolymer has a composition that varies along the length of the polymer chain from ring-opened azlactone terminal group to opposite terminal group based on the relative reactivity ratios of the monomers and instantaneous concentrations of the monomers during polymerization.
4. (Original) The (co)polymer of claim 1, wherein said (co)polymer comprises polymerized monomer units selected from the group consisting of (meth)acrylic acid; (meth)acrylates; fumaric acid (and esters), itaconic acid (and esters), maleic anhydride; styrenics; vinyl halides; (meth)acrylonitrile; vinylidene halides; vinyl esters of carboxylic acids; amides of vinyl amines; monomers containing a secondary, tertiary or quaternary amino group; butadienes; unsaturated alkylsulphonic acids or derivatives thereof; 2-vinyl-4,4-dimethylazlactone, and N-vinyl pyrrolidinone and mixtures thereof; said (co)polymer having a first azlactone terminal

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group and a second terminal group selected from a xanthate group, a thioxanthate group, or a dithioester group.

5. (Original) The (co)polymer of claim 1 having the structure

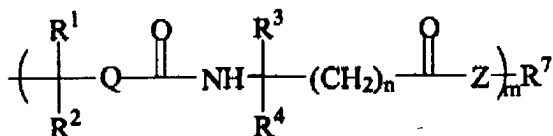
$Az-(M^1)_x-S-Y$ , wherein

S-Y is a xanthate group of the formula  $R^5-O-C(S)-S-$ , a thioxanthate group of the formula  $R^5-S-C(S)-S-$ , or a dithioester group of the formula  $R^5-C(S)-S-$ , wherein

$R^5$  is selected from an alkyl group, a cycloalkyl group, an aryl group, a heterocyclic group or an arenyl group;

$M^1$  is a monomer unit derived from a radically (co)polymerizable monomer unit having an average degree of polymerization  $x$ , and

Az is a ring-opened azlactone group of the formula:



wherein

$R^1$  and  $R^2$  are each independently selected from X, H, an alkyl group, a cycloalkyl group, a heterocyclic group, an arenyl group and an aryl group, or  $R^1$  and  $R^2$  taken together with the carbon to which they are attached form a carbocyclic ring;

$R^3$  and  $R^4$  are each independently selected from an alkyl group, a cycloalkyl group, an aryl group, an arenyl group, or  $R^3$  and  $R^4$  taken together with the carbon to which they are attached form a carbocyclic ring;

$R^7$  is an organic or inorganic moiety and has a valency of  $m$ ;

$m$  is 1 to 8;

$Q$  is a linking group selected from a covalent bond,  $(-CH_2-)_o$ ,  $-CO-O-(CH_2)_o-$ ,  $-CO-O-(CH_2CH_2O)_o-$ ,  $-CO-NR^6-(CH_2)_o-$ ,  $-CO-S-(CH_2)_o-$ , where  $o$  is 1 to 12, and  $R^6$  is H, an alkyl group, a cycloalkyl group, an arenyl group, a heterocyclic group, or an aryl group;

$Z$  is  $-O-$ ,  $-S-$  or  $-NR^8-$ , wherein  $R^8$  is H, an alkyl group, a cycloalkyl group, an arenyl group, a heterocyclic group or an aryl group;

and  $n$  is 0 or 1.

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6. (Currently amended) The (co)polymer chain-transfer agent of claim 5 wherein at least one of  $R_1$  and  $R_2$  are methyl.

7. (Currently amended) The (co)polymer chain-transfer agent of claim 5 wherein at least one of  $R_3$  and  $R_4$  is a  $C_1$  to  $C_4$  alkyl group.

8. (Currently amended) The (co)polymer chain-transfer agent of claim 5 wherein  $R^7$  is a solid support.

9. (Currently amended) The (co)polymer chain-transfer agent of claim 5 wherein  $R^7$  is the residue of a polymeric or non-polymeric, nucleophilic group-substituted compound,  $R^7(ZH)_m$ , in which Z is -O-, -S-, or  $-NR^8$  wherein  $R^8$  can be a H, an alkyl, a cycloalkyl or aryl, a heterocyclic group, an arenyl and m is at least one.

10. (Currently amended) The (co)polymer chain-transfer agent of claim 5 wherein  $R^7$  comprises a non-polymeric aliphatic, cycloaliphatic, aromatic or alkyl-substituted aromatic moiety having from 1 to 30 carbon atoms.

11. (Currently amended) The (co)polymer chain-transfer agent of claim 5 wherein  $R^7$  comprises a polyoxyalkylene, polyester, polyolefin, poly(meth)acrylate, or polysiloxane polymer having pendent or terminal reactive -ZH groups.

12. (Currently amended) The (co)polymer of claim 1 having the structure

$Az-(M^1)_x(M^2)_x-(M^3)_x\dots(M^n)_x-SY$ , wherein

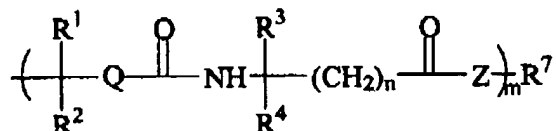
S-Y is a xanthate group of the formula  $R^5-O-C(S)-S-$ , a thioxanthate group of the formula  $R^5-S-C(S)-S-$ , or a dithioester group of the formula  $R^5-C(S)-S-$ , wherein

$R^5$  is selected from an alkyl group, a cycloalkyl group, an aryl group, a heterocyclic group or an arenyl group;

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$M^1$  to  $M^n$  are each polymer blocks of monomer units derived from a radically (co)polymerizable monomer units having an average degree of polymerization  $x$ , each  $x$  is independent, and  
 Az is a ring-opened azlactone group of the formula:



wherein  $R^1$  and  $R^2$  are each independently selected from X, H, an alkyl group, a cycloalkyl group, a heterocyclic group, an arenyl group and an aryl group, or  $R^1$  and  $R^2$  taken together with the carbon to which they are attached form a carbocyclic ring;

$R^3$  and  $R^4$  are each independently selected from an alkyl group, a cycloalkyl group, an aryl group, an arenyl group, or  $R^3$  and  $R^4$  taken together with the carbon to which they are attached form a carbocyclic ring;

$R^7$  is an organic or inorganic moiety and has a valency of  $m$ ;

$m$  is 1 to 8

$Q$  is a linking group selected from a covalent bond,  $(-CH_2)_o$ ,  $-CO-O-(CH_2)_o-$ ,  $-CO-O-(CH_2CH_2O)_o-$ ,  $-CO-NR^8-(CH_2)_o-$ ,  $-CO-S-(CH_2)_o-$ , where  $o$  is 1 to 12, and  $R^8$  is H, an alkyl group, a cycloalkyl group, an arenyl group, a heterocyclic group or an aryl group;

$Z$  is  $-O-$ ,  $-S-$  or  $-NR^8-$ , wherein  $R^8$  is H, an alkyl group, a cycloalkyl group, an arenyl group, a heterocyclic group or an aryl group;

and ~~And~~  $n$  is 0 or 1.

13. (Currently amended) The (co)polymer chain transfer agent of claim 12 wherein at least one of  $R_1$  and  $R_2$  are methyl.

14. (Currently amended) The (co)polymer chain transfer agent of claim 12 wherein at least one of  $R_3$  and  $R_4$  is a  $C_1$  to  $C_4$  alkyl group.

15. (Currently amended) The (co)polymer chain transfer agent of claim 12 wherein  $R^7$  is a solid support.

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16. (Currently amended) The (co)polymer chain-transfer agent of claim 12 wherein R<sup>7</sup> is the residue of a polymeric or non-polymeric, nucleophilic group-substituted compound, R<sup>7</sup>(ZH)<sub>m</sub>, in which Z is -O-, -S-, or -NR<sup>8</sup> wherein R<sup>8</sup> can be a H, an alkyl, a cycloalkyl or aryl, a heterocyclic group, an arenyl and m is at least one.

17. (Currently amended) The (co)polymer chain-transfer agent of claim 12 wherein R<sup>7</sup> comprises a non-polymeric aliphatic, cycloaliphatic, aromatic or alkyl-substituted aromatic moiety having from 1 to 30 carbon atoms.

18. (Currently amended) The (co)polymer chain-transfer agent of claim 12 wherein R<sup>7</sup> comprises a polyoxyalkylene, polyester, polyolefin, poly(meth)acrylate, or polysiloxane polymer having pendent or terminal reactive -ZH groups.

19. (Original) The (co) polymer of claim 12 having a star, comb, block, or hyperbranched structure.

20. (Original) The (co) polymer of claim 19 having pendent, nucleophilic functional groups.

21. (Original) The (co)polymer of claim 20 comprising interpolymerized monomer units having pendent, nucleophilic functional groups.